

DEEP HOLE STATES IN TWO PARTICLE TRANSFER REACTIONS

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The purpose of this experiment is to search for enhanced structure at high excitation energy in two neutron transfer reactions on medium and heavy mass nuclei. Such structure has been seen at between 6 and 9 MeV of excitation in (p,t) reactions in Sn, Cd, and Pd isotopes at 42 MeV bombarding energy where the structure has been tentatively identified as arising from pickup from deep lying shells.¹ Experiments at higher bombarding energy using the Indiana Cyclotron will cast further light on this phenomenon. In particular, the position of the enhanced structure should be independent of bombarding energy, although some change in the detailed shape may be observed because of the different ℓ -transfers which are favored at different bombarding energies (see Fig. 1). The shape of the angular distribution can also be predicted at 90 MeV bombarding energy (see Fig. 2). The agreement between the experimental and predicted angular distributions for $^{116}\text{Sn}(p,t)$ and $^{120}\text{Sn}(p,t)$ at 42 MeV is quite good,¹ so that a further comparison at 90 MeV bombarding energy would elucidate the question of the origin of the enhancement. In addition, at the higher bombarding energies of the IUCF, a search will be made for enhanced structure in heavier nuclei and possibly at higher excitation energy using the (p,t) reaction. The $(\alpha,^6\text{He})$ reaction

will also be studied since this is likely to favor different ℓ transfers than the (p,t) reaction at a similar bombarding energy.

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- 1) G.M. Crawley, W. Benenson, D. Weber, and B. Zwiaglinski, Phys. Rev. Letters 39, 1451 (1977).

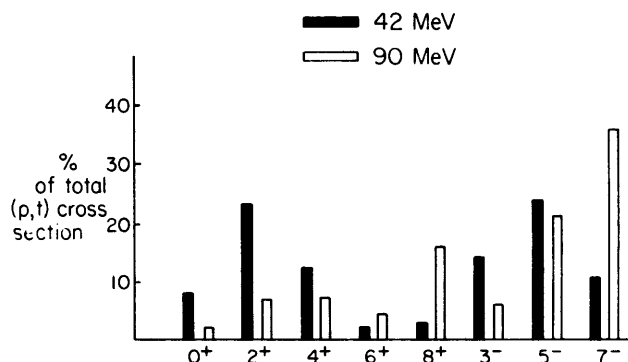


Figure 1

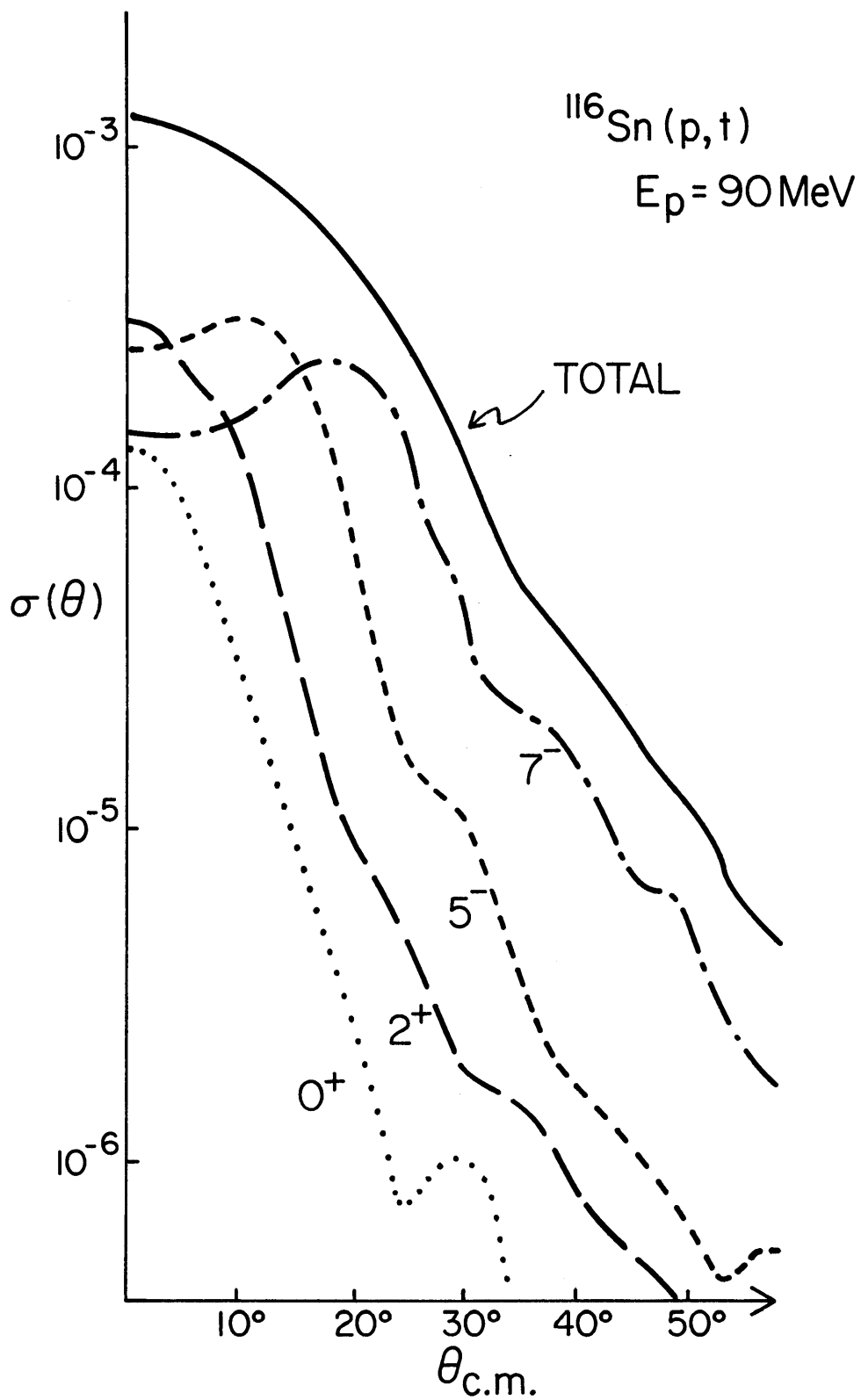


Figure 2